

CHAPTER II

PLANS REQUIRED BY THE FEDERAL GOVERNMENT

All operators of LP gas systems are required to maintain plans for operations, maintenance and emergency response activities. Most operators comply with this requirement by developing and maintaining a manual that incorporates these plans. The manual must be prepared before operation of an LP gas system commences and must be reviewed and updated once a year. The manual must be available at locations where operations and maintenance activities are conducted. This manual fulfills the requirements of 49 CFR Part 192.605.

NOTE: The Federal DOT/OPS or the state agency certified under the Pipeline Safety Act may after due process require the LP gas operator to amend its plans and procedures as necessary to provide a reasonable level of safety.

OPERATIONS AND MAINTENANCE PLAN

An operations and maintenance plan is required of all LP gas operators by the pipeline safety regulations. The operations and maintenance plan must be written and followed to help the operator comply with the pipeline safety regulations. See 49 CFR 192.603 for further information.

OPERATIONS PLANS

Each operator shall include in its written plan, procedures for all operations which may be performed on the LP gas system by the operator or on behalf of the operator.

The following is a discussion of some of the operations procedures which may be encountered in a typical LP gas distribution system.

The operations topics covered here are:

- operating pressure
- pressure testing
- tapping and purging of the LP gas pipeline distribution facilities
- odorization
- testing for reinstating a service line
- abandonment or deactivation of pipeline or LP gas distribution facilities
- construction records, maps and operating history
- unaccounted for gas

Operating Pressure

Per the NFPA 58 (LP-Gas Code), first stage regulators shall have an outlet pressure up to 10.0 psig and incorporate an integral pressure relief valve, all in accordance with the Standard for LP-Gas Regulators, UL 144. These are typically factory set and non adjustable. This would limit the operating pressure of a typical newly installed system to a maximum of 10 psig.

In cases where the regulators in use are other than the 10 psig or less standard, further consideration must be given to setting an operating pressure, such as using an adjustable high pressure regulator with a 10 psig regulator between it and the second stage regulator(s). These situations might include a system put in service prior to the adoption of the 10 psig standard or where special order adjustable regulators are used.

The LP-Gas Code states that polyethylene piping systems shall be limited to vapor service not exceeding 30 psig. As discussed in Chapter II concerning materials, steel piping must be designed at either 125 psig, 250 psig or 350 psig.

These types of factors, based on material design and LP gas properties, can be used in conjunction with a pressure test conducted to verify the integrity of the piping system to arrive at an operating pressure. However, it is recommended operators of the small LP gas systems stay within the 10 psig standard for their distribution piping.

Operating pressure determination should be documented in the operator's written plan.

Pressure Testing

Pressure testing must be performed to verify the integrity of the piping system prior to placing it into service, when newly constructed or upon subsequent modification. The LP-Gas Code states that this pressure test can be done at not less than the normal operating pressure. Most operators test at a higher pressure than operating pressure. It is recommended that all operators follow this practice.

Pressure tests should be documented by the personnel performing the test and copies should be maintained for the life of the system.

Information documented should include:

- description of facilities
- date, time and location of test
- time on and off, duration of test
- initial and final pressure or recording chart if available
- test medium
- person conducting the test
- ambient conditions, temperature, weather



Tapping and Purging

Tapping and purging operations should be performed in accordance with written procedures by personnel with documented qualification in the use of those procedures (i.e. the LP gas distribution system operator should obtain and maintain copies of the qualifications of the individuals performing this operation). A good source of procedural information is the American Gas Association (AGA) Operating Section Report entitled Purging Principles and Practice. It is recommended that a purge medium, such as nitrogen, be used, if practical, or as a slug between air and gas. Water may also be used where the system will not be placed back in service. If air is used, care should be exercised to ensure that a flammable mixture of LP gas and air is not created. An instrument, such as a combustible gas indicator, should be used to verify gas purged in or out of the system. Points of introduction of purge medium and venting should be chosen to thoroughly purge the piping system.

Information documented should include:

- date and time of purge
- time on and off, duration of purge
- purge medium
- person conducting the purge
- ambient conditions
- further documentation discussed below in the case of facility abandonment



Odorization

The LP-Gas Code specifies that LP gas be odorized prior to delivery to the bulk plant. It goes on to require verification by “sniff-testing or other means, **and the results shall be documented**” when gas is delivered to the bulk plant or in the case where a delivery bypasses the bulk plant. If the documentation required by the LP-Gas Code is not available to the LP gas system operator, then the operator will need to do his own sniff tests to verify odorization and document the results.

Testing for Reinstating Service Lines

The written plan must contain a provision for testing (before placing in service) each service line that is disconnected from the main in the same manner as a new service line (49 CFR 192.725). Test procedure and documentation are discussed above.

Abandonment or Deactivation of Facilities

The written plan must include provisions for shutdown, abandonment or deactivation of facilities (49 CFR 192.727). When a gas main or service line is abandoned, it must be physically disconnected from the piping system and open ends effectively sealed. In addition, the operator must determine the necessity of purging the line. Note: Take into consideration the location and size of the main or service. As a recommendation, pipe two inches and larger should be purged.

In cases where the main and all the service lines connected to it are abandoned, the service line(s) must be capped at the customer's end. Also, the abandoned main must be sealed at both ends.

When service to a customer is temporarily or permanently discontinued, one of the following must be done:

- The valve must be closed to prevent the flow of gas to the customer. This valve must be secured with a lock or some other device to prevent opening of the valve by unauthorized people. There are numerous locking devices designed for this purpose.
- A mechanical device or fitting that will prevent the flow of gas must be installed in the service line or in the meter assembly.
- The customer's piping must be physically disconnected from the gas supply and the open ends sealed. (49 CFR 192.727).



Construction Records, Maps and Operating History

Construction records should include detailed construction plans, modified as appropriate to show the as-built condition of the facilities. These plans and maps should show in detail, the location of all facilities and date of installation. Maps should have enough detail to accurately determine the physical location of all facilities.

A detailed bill of materials should be included. This should provide specifications of the materials used, including manufacturer, size (diameter, wall thickness, etc.), pressure rating, manufacturing standard, etc.

Additional construction records may include:

- joining procedure qualifications
- pipe joiner and other personnel qualification records
- inspection records for visual, destructive and non-destructive testing
- pressure test
- date of cathodic protection application for steel

All system modifications should be recorded in detail.

Operating history should include records of all system modifications and repairs, areas of active corrosion, history of areas susceptible to damage and operating pressure records.

Unaccounted For Gas

LP gas systems serving 100 or more customers from a single source are required to file an annual report. Part of this report must be the system's percentage of unaccounted for gas. Unaccounted for gas is the difference between the amount of propane delivered into the system and the amount that is recorded through the customers' meters. Unaccounted for gas can be caused by measurement and control errors, system leakage and theft.

Temperature and pressure affect gas density. For this reason, temperature-compensating meters are widely used. For customers with high gas usage, the meter can be located upstream of the second stage pressure regulator so that a smaller (less costly) meter can be used. Where the meter is located upstream of the second stage pressure regulator, a constant pressure must be maintained. Otherwise meter readings will not be accurate and can lead to an amount of unaccounted for gas. Pressure-compensating meters are available.

The better the control on gas measurement, the easier it is to spot problems in other areas that affect unaccounted for gas.

MAINTENANCE PLANS

During the required periodic maintenance checks that are required by the Federal Pipeline Safety Regulations, operators should observe the system to ensure that there are no violations of NFPA 58.

Some of the areas to check are:

- Loose combustible materials are not stacked within ten feet of the LP gas tank.



- If a security fence is required, it is in adequate repair. All necessary gates are accessible in case of an emergency. Gates are locked when operator personnel are not present.



- Important buildings have not been added closer to the tank(s) than permitted in NFPA 58.



- Signs that are required on some installations are being maintained.

Maintenance plans must contain the following components:

Pressure Limiting Devices

It is important that all systems operate within their intended acceptable pressure limits. Devices must be maintained annually to ensure that they are:

- in good mechanical condition
- capacity is adequate
- set to function at correct pressure
- properly installed and protected from vehicular traffic, dirt, liquids, icing and other conditions that might prevent proper operation



Lock up testing and/or the use of pressure recording devices are ways to prove regulator stability. First stage regulators are now required to have built-in pressure relief devices per NFPA 58, unless the capacity of the regulator is more than 500,000 Btu/hr. In this case a separate pressure relief valve may be used.

Some LP gas systems use vaporizers in their systems. Hydrostatic relief valves and vaporizer relief valves are normally part of a system that uses vaporizers. The O&M plan should include the methods in which all pressure limiting devices are maintained.

Patrolling

Although this is normally not necessary for small LP gas systems, if a condition exists in the area of an LP gas system where anticipated movement of the pipeline could cause failure or leakage (e.g., weight from construction, area prone to wash out, etc.), then the pipeline shall be periodically patrolled until the condition no longer exists. The frequency of the patrolling must be determined by the severity of the conditions which could cause failure or leakage and consequent hazards to safety, but no fewer than four times each calendar year in the business district or twice each calendar year outside of the business district.

Example of a washout area found by patrol



Key Valves



Key valves, or critical valves, are the valves needed to shut down the LP system, or part of the LP system, in the event of an emergency. For many LP gas systems, this would be the container main valve. Key valves should be checked at least once per year to ensure that they are operable. Procedures for maintaining these valves must be included in the maintenance section of the O&M Manual.

Accidental Ignition of Gas

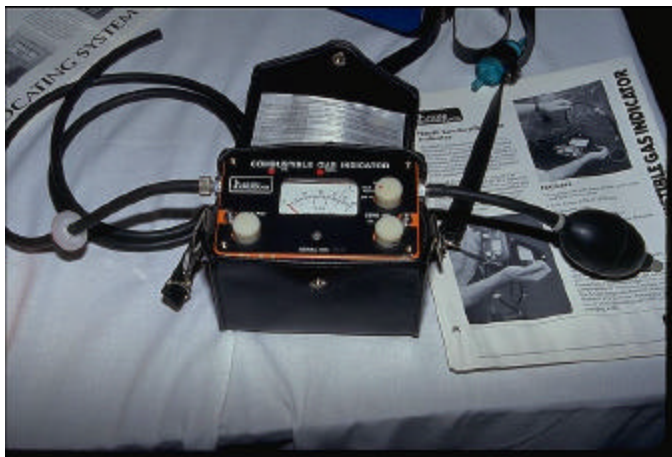
The plan must include provisions to prevent the accidental ignition of gas. LP gas alone is not explosive but when mixed with air in a concentration of 2.15% to 9.6% for propane, it can ignite or explode. Every precaution should be taken to prevent unintentional ignition of LP gas. When venting gas to the air a fire extinguisher must be available and positioned for immediate use.

Leak Survey

A survey of an LP gas distribution system must be made as frequently as necessary, but at intervals not exceeding **five years**. If part or all of the system is located in a business district, a gas leakage survey must be conducted at least **once every year**. Procedures on how to conduct leak surveys must be included in the maintenance section of the O&M manual.

Some LP gas operators use contractors to leak survey their systems. It is the responsibility of the operator to ensure that the survey is conducted in accordance with the pipeline safety regulations. The operator must retain a report describing the results of each survey.

LP gas operators must do a subsurface type of survey when using gas detection equipment to perform their survey. Although an FI (Flame Ionization) unit may be used to assist in the survey, a CGI (Combustible Gas Indicator), must be used for pinpointing leaks and classifying them.



Many LP gas operators opt to do a pressure drop test to prove the integrity of their pipeline. This is normally done on smaller systems, where shutting off the customers is not a problem. **A very important thing to consider is, if you do have any drop in pressure, then you must do a subsurface survey using a CGI meter.** A pressure drop test tells you if you have a leak. It does not tell you the location of the leak or its classification.

Other things to consider when doing a pressure drop test are:

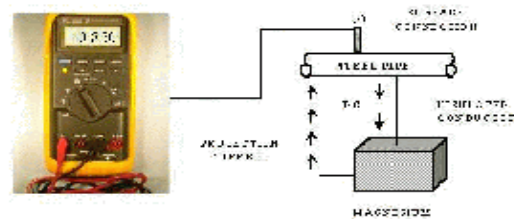
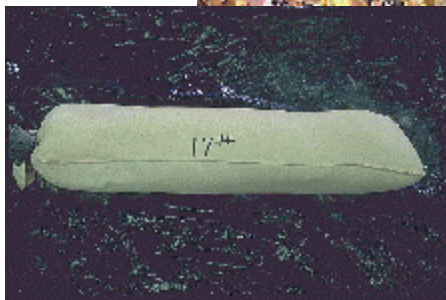
- Pressure used during the test should be at least equal to the operating pressure.
- Time duration of the test should consider the volume of the pipeline being tested; the time for the test medium to become temperature stabilized and the sensitivity of the instrument being used.

An advantage of doing this type of test is that the first stage regulator can be tested for lock up at the same time. Some operators use a portable supply tank on certain systems, and temporarily connect it into a tee just before the second stage regulator. With the proper valving installed ahead of time, they can perform a leak test of the piping and lock up on the regulator without shutting down the system.

For more information on performing leak surveys see Chapter X. This chapter includes useful information from **AGA** and the **Gas Pipeline Technology Committee**.

Corrosion Testing

Underground steel mains, including underground tanks must be tested annually to prove that the systems are being cathodically protected. Although there are five acceptable methods of testing, the most common method being used for small systems is the negative 0.85 dc volt criteria. Aboveground piping and tanks must be inspected for atmospheric corrosion at no longer than three year intervals, although for many LP gas systems it is easy and good practice to observe the condition of the aboveground piping during other annual maintenance. For more information on corrosion and compliance refer to 49 CFR Part 192 Subpart I and CHAPTER VIII of this manual.



EMERGENCY PLANS

Each operator is required to maintain a written plan of procedures and other necessary information to meet LP gas emergency situations. The federal regulations for emergency plans are contained in 49 CFR Part 192.615 of the federal Pipeline Safety Regulations. It is also the responsibility of the LP gas operator to be familiar with all state and local regulations as they apply to emergency situations regarding their piping systems.

The written emergency plan should contain the following information:

1. Emergency notification list.
2. Map of key valve locations.
3. Description and location of emergency equipment.
4. Plan for responding to gas leak reports and interruption of service.
5. Checklist for a major emergency.
6. Reporting requirements; both telephonic and written reports.
7. Plan for restoration of service after an outage.
8. Accident investigation procedures.
9. Education and training plan.

1. EMERGENCY NOTIFICATION LIST – The telephone numbers of the LP gas system operator, local fire department, emergency ambulance service, local law enforcement agencies, LP gas distributor, state and local regulatory agencies and any other entity whose service may be necessary in an emergency must be readily accessible to all operator personnel who may be involved in emergency situations. For master meter operators, a copy of this list should be posted in a public area and the tenants should be made aware of its location. This notification list must be kept current.

All operating personnel and customers should be familiar with local 911 calling procedures.

2. MAP OF KEY VALVE LOCATIONS – A map of the LP gas system indicating the location of key valves and master meters must be included in the emergency plan. An easily recognizable legend should be used on the map for quick identification of the key valves and master meters.
3. DESCRIPTION AND LOCATION OF EMERGENCY EQUIPMENT – Emergency equipment must be available. A description of the equipment and its location must be specified in the emergency plan. The list should include any equipment that would be available from the LP gas distributor and contractors. Agreements with the local distributor and contractors on the use of their equipment should be in place before the emergency occurs.
4. PLAN FOR RESPONDING TO GAS LEAK REPORTS AND INTERRUPTION OF SERVICE – The operator must have written procedures to be followed in response to gas leaks reported by customers. It is the responsibility of the LP gas operator to ensure that

all employees are familiar with the procedures for responding to gas leak calls and reports.

- The employee receiving a report of a gas leak must get as much information as possible to assist in completing a leak report. A typical leak report is included in Appendix B, Form 10. Use common sense; saving human life is the first priority followed by preserving property.
- All reports of leaks on customer premises get priority. LEAKS INSIDE A BUILDING GET TOP PRIORITY.



- Upon determining that a hazardous leak exists inside a building, remind the person initiating the leak call of the following:
 - Do not turn on or off any electrical switches.
 - Do not ring doorbells or use the telephone. If the call is being made from the telephone within the building, inform the person not to hang up the telephone receiver.
 - Do not light matches or cigarettes.
 - Do not use the garage door opener or start any automobile engines within or near the building.
 - If possible, extinguish all open flames. Note: Evacuation time is important.

- Evacuate the building to a safe distance (about a city block). Walk away – do not use a vehicle.
 - If possible, turn off the gas supply. Remember: Evacuation time is important.
- Dispatch necessary personnel to the location of the reported leak. This could include local emergency responders such as fire and police personnel.
- It is the responsibility of the first company employee on the scene to take whatever corrective action is necessary to protect life and property (in that order). As required, the person in charge must:
 - Set up communications.
 - Coordinate the on-scene emergency response operation.
 - Make decisions concerning operation of emergency valves, isolating the area and use of emergency equipment.
 - Implement the emergency checklist.

It is important for all responders to know their limitations. They should not take undue risks that may endanger their personal safety.

- Operator responses for leaks near buildings include as a minimum:
 - Assess danger to building occupants, to the public and to property.
 - Extinguish all open flames.
 - If necessary, notify fire, police and LP-gas personnel who are prepared to respond to emergencies.
 - Cordon off the area and initiate traffic control. Note: This may be a police responsibility.
 - Notify the supervisor or other responsible personnel.
 - Bar hole next to the foundation of the building and perform an instrument leak survey.
 - Check neighboring buildings for the presence of gas.
 - Implement the checklist for emergency situations.
 - Repair the leak.
 - Return occupants to the building only when positively certain that the area is safe.
- Operator responses for leaks inside a building include as a minimum:
 - Make an immediate evaluation to determine the concentration of gas and the source of the leak.
 - Evacuate the building if necessary.
 - Do not use any electrical devices including the telephone.

- Shut off the gas at the meter or at another valve (curb valve or a key valve).
 - Bar hole around the foundation and perform an instrumented leak survey. Check near water meters, other openings and in depressions.
 - If house and surrounding area are gas free, turn on gas valve. Check all gas piping and appliances for leaks. Check for meter movement – is it moving normally or at a faster rate?
 - Conduct a soap bubble test with an approved solution.
 - Repair any leaks.
 - If leak cannot be repaired at the time, notify the customer. Turn off and lock the meter. Tag the meter.
- Operator responses for gas burning inside a building include as a minimum:
 - Call the fire department.
 - Master meter operators should also call the LP-gas distributor.
 - If the fire is at an appliance, shut off the gas to the appliance. If possible, this should be done at the appliance valve.
 - If it is not possible to shut off the appliance valve, it may be necessary to shut off the service valve on the riser, a curb valve or a key valve.
 - Implement the checklist for emergency situation

5. CHECKLIST FOR A MAJOR EMERGENCY – Every item may not be necessary.

- _____ 1. Has the fire department been called?
- _____ 2. Have persons been evacuated and the area cordoned off?
- _____ 3. Has police department been notified?
- _____ 4. Has repair crew been notified?
- _____ 5. Has company call list been implemented?
- _____ 6. Has communication been established?
- _____ 7. Has outside assistance been requested?
- _____ 8. Have ambulances been requested?
- _____ 9. Have emergency valves to shut down or reroute the gas been identified and located?
- _____ 10. Has leak been shut off or brought under control?
- _____ 11. Has civil defense or local emergency response crew been notified?
- _____ 12. Has the radio and/or television station been given emergency broadcast instructions?
- _____ 13. If an area has been shut off, have the individual services in the area been shut off?
- _____ 14. Is the situation under control and has the possibility of recurrence been eliminated?
- _____ 15. Has the surrounding area, including adjacent buildings been probed for the possibility of further leakage?
- _____ 16. Have tags been placed on the necessary meters?

- _____ 17. Have telephonic reports been made to the state or local regulatory agencies?
- _____ 18. Has a telephonic report been made to the federal Office of Pipeline Safety National Response Center?

Date _____

6. REPORTING REQUIREMENTS; BOTH TELEPHONIC AND WRITTEN REPORTS -
In the case of an incident, a telephonic report must be made within two hours to the National Response Center (1-800-424-8802). In Washington, DC, the telephonic report is made to 267-2675.

An incident is an event involving the release of gas from a pipeline system and:

1. A death or an injury requiring in-patient hospitalization, or
2. Estimated property damage of \$50,000 or more.

A written report must be submitted on USDOT Form RSPA F7100.1 as soon as practicable, but not more than 30 days after detection of an incident. Master meter systems must make the telephonic report but are exempted from the written report.

The address for written incident reports to the federal government is:

Information Resources Manager
Office of Pipeline Safety
Research and Special Programs Administration
USDOT, Room 7128
400 Seventh Street, SW
Washington, DC 20590

NOTE: LP gas operators should check with state regulatory agencies for additional reporting requirements.

7. PLAN FOR RESTORATION OF SERVICE AFTER AN OUTAGE – Qualified persons must follow proper written procedures to safely restore service after an outage. The procedures must include details for re-lighting appliances.

Gas service must be restored on a building-by-building basis throughout the affected area. First, service to each customer must be shut off, either at the meter or at a curb valve. If this cannot be done, the gas flow can be shut off by squeezing off the line.

Before restoring service to an affected area, all gas piping and meters must be purged of air. Then re-lights can be accomplished. Never turn on the gas at the meter unless access is available to all appliances on the customer piping. If the operator cannot get access to a customer's building facilities, notification must be left in a conspicuous location requesting the customer to call the LP gas operator to schedule the restoration of service.



Ahlgas Propane Service

**CGI
Couldn't Get In**

Your gas service was interrupted due to:

1. out of gas
2. other

We could not get in to safety check your gas appliances so we have left the gas turned off.

Please call 234-9804 so that we can make arrangements to turn your gas back on.

The person in charge of the restoration of service must accept the entire responsibility for following the written procedures.

A written record of the incident with all necessary information, including the information on restoration of service, must be kept in a permanent file.

8. **ACCIDENT INVESTIGATION PROCEDURES** – Each operator must establish written procedures for analyzing accidents and failures to determine the cause of the failure and minimize the possibility of recurrence. The procedures must include:

- Evaluation of the situation.
- Secure the area to protect evidence.
- Review of applicable operating and maintenance plans.
- Review of equipment specifications.
- Review of emergency procedures.
- Conduct leak survey, pressure tests of piping and equipment, meter tests and regulator checks.

- Interviewing of persons at the scene.
- Examination of burn and debris patterns.
- Checking odorization levels.
- Review of meter and gauge readings.
- Notation of weather conditions.
- Selection of samples of failed facility or equipment for laboratory analyses to determine the causes of the failures.

9. **EDUCATION AND TRAINING PLAN** – Operating personnel and other emergency responders must be qualified to ensure understanding of emergency procedures and equipment. It is the responsibility of the operator to conduct adequate training and to keep records of the training. Training should include:

- Updating of the written emergency plans.
- Review of personal responsibilities in emergency situations.
- Review of location and use of emergency equipment.
- Properties of LP gas.
- Review the locations and use of system maps and records, maintenance records, valve records and operating procedures.
- Review of typical emergency situations to reinforce the step-by-step actions to be followed in emergencies. This includes methods of contacting public officials, firefighters, police and LP gas distributors.
- Review of record keeping requirements.
- Review the procedures for making telephonic and written reports.

PUBLIC EDUCATION PLAN

The operator also has a responsibility to conduct a continuing education program that enables customers, the public and excavators to recognize and respond to emergency situations. The education program can include:

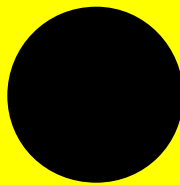
- Information about the properties of LP gas.
- Recognition of the odorants used in LP gas.
- Actions to take when a strong gas odor is present.
- Applicable one-call procedures prior to excavation.
- 24-hour telephone numbers for reporting gas leaks.

Scratch and Sniff

Ahlgas Propane Company

Propane is an odorless gas, so an odor has been added to warn you if there is a leak.

Please scratch in the circle below and smell that area to familiarize yourself with the odor.



Whenever you smell that odor please call us at 234-9804.

This educational information may be conveyed to the interested parties by a number of means, including:

- Radio and television.
- Newspapers and newsletters.
- Public meetings and one-on-one encounters.
- Bill stuffers, mailings and handouts.
- Billboards and bulletin boards.

If a significant percentage of the population in the operator's area does not speak English, the education and training must be conducted in a language understood by the non-English speaking community.

The operator must maintain records of the public education program.

Many excellent educational pamphlets and other training aids are available from the National Propane Gas Association. Their address is:

National Propane Gas Association
1600 Eisenhower Lane, Suite 100
Lisle, IL 60532